ET Doc. 13-208

Standard Operating Procedure

LABORATORY ACCREDITATION BUREAU	Subject: Technical Review	SOP 218
Approved by: Doug Leonard	Revision 11 Date: 08/20/10	Page 1 of 5

Purpose

L-A-B assures the validity of its accreditations by utilizing a comprehensive technical review process. This procedure defines the process and requirements for performing technical reviews of accreditation information.

Scope

Technical reviews are performed to assure that all information necessary to the accreditation process is in place and correctly completed by competent personnel. Technical reviews may include assessment technical packages, scope ballot review, scope expansions, and various information that L-A-B may need reviewed by technically competent personnel.

Responsibility

All technical reviews will be performed by technically competent L-A-B technical staff, L-A-B TAG members, or competent experts in the field of review. The appropriate L-A-B Technical Staff Member is responsible for correct completion of the technical review of information.

Procedure

Technical reviewers will be provided all necessary information and time required to perform a thorough and complete technical review. Technical reviewers may request additional time or information if necessary to complete the review.

Assessment Documentation L-A-B Technical Review

1. When the Assessor assessment documentation has been received, the appropriate L-A-B staff shall review to assure all required assessment documentation has been received and completed correctly. If the package is incomplete the Lead Assessor will be asked to provide the missing information.
2. Upon receipt of the L-A-B Form 14, L-A-B staff will perform a L-A-B technical review to determine if there are any serious concerns identified such as immediate removal of scope items, recommendation for follow up work or suspension. If identified, L-A-B technical staff will determine the appropriate actions necessary.
3. Upon receipt of the corrective actions from the client (if applicable), the assessment documentation will begin technical review.

Assessment Documentation Technical Review

1. All documentation required to be completed as part of the assessment process, including the laboratories corrective action responses, will be technically reviewed by competent personnel.

2. The appropriate L-A-B Program Manager is responsible for assuring all assessment documentation and laboratory Non-Compliance responses are technically reviewed.
3. Initial and full reassessment documentation packages are required to have two levels of technical review; a L-A-B technical review and a TAG technical review. The L-A-B technical review is typically performed by technically competent L-A-B staff but may be performed by competent TAG members. Secondary reviews are performed by competent TAG members.
4. Surveillance assessment documentation packages only require a single review. This review is typically performed by L-A-B technical staff but may be performed by competent TAG members.
5. The L-A-B technical reviewer will be independent from the assessment.
6. The technical review will assure all required assessment documentation is in place and correctly completed. It will also assure that all non-compliances have been addressed by the lab and resolved or an effective plan for resolution is in place.
7. Each level of technical review must include evaluation and documentation of at least the following areas:
    a. Documented details of assessment activities;
    b. Scope of accreditation;
    c. Calibration Measurement Capability (Calibration Labs);
    d. Needs Assessment (Test labs);
    e. Non-Compliances and evidence of laboratory corrective actions (where necessary);
    f. Proficiency testing activities;
    g. Technical evaluation activities performed during the assessment.
8. Where the technical review of the assessment documentation requires additional evidence or clarification, either the Assessor and/or the Client will be notified to acquire the information for effective technical review.
9. The responses of the laboratory to resolve nonconformities are technically reviewed by competent L-A-B Staff or TAG to see if the labs actions appear to be sufficient and effective.
    a. If the laboratories responses are found not to be sufficient, further information is requested. Evidence of effective implementation of actions taken may be requested.
    b. A follow-up assessment may be carried out to verify effective implementation of corrective actions.
10. Each level of technical review will provide a recommendation on continuance of accreditation.
11. L-A-B Program Managers are responsible to assure that the technical review has been completed within a reasonable amount of time.
12. Upon completion of the technical review process, the L-A-B President / COO or appropriate Program Manager will utilize the technical review process to assure the laboratory meets accreditation requirements and is suitable for accreditation.

13. L-A-B President / COO must provide the final signature approval of the assessment documentation package and approval of accreditation for all initial and reaccreditation assessments.
14. L-A-B President / COO or appropriate Program Manager may provide the final signature approval of the assessment documentation package and approval of accreditation for surveillance assessments.
15. L-A-B President / COO or Program Managers will not provide final approval of assessments for which they were the Lead Assessor or part of the assessment team. The approval will be made by the most appropriate L-A-B Program Manager.
16. Where there is a conflict of interest or a potential conflict of interest, the reviewer is to notify L-A-B about the instance.

Scope of Accreditation Review

1. Review of the L-A-B scope of accreditation will typically include:
    a. Where necessary for Calibration scopes, the appropriateness of the CMC based on the information submitted in the uncertainty budgets. (Reference Annex A of the Assessor Handbook);
    b. Representation of the units of measure in accordance with NIST SP 811;
    c. Consistency of format per L-A-B proposed scope guidelines;
    d. Inclusion of appropriate notes to specifically define the scope and limitations;
    e. Review of the L-A-B Major Field category for correctness.
2. Review of the proposed scope will typically be documented on L-A-B Form 218.1, Form 218.8 or the appropriate L-A-B program specific form.
3. All assessments require at least one scope review by the appropriate L-A-B staff or TAG Member.
4. Successful review on the Scope(s) of Accreditation is required to maintain an approved scope on the website.

Technical Review Documentation

1. Technical reviews of all assessment information from the assessment process will be captured on the L-A-B Form 218.1 - Technical Package Compliance Report. Details of the review activities and indication of compliance for each area are documented on this form.
2. TAG Technical reviews will be returned to the appropriate Program Manager when complete. All outstanding issues uncovered during the course of performing a technical review will be resolved by the L-A-B Technical Staff prior to approval by the President / COO.

Scope Expansion Technical Review

1. Any expansion of scope requires technical review by competent personnel.
2. When a laboratory requests a scope of accreditation expansion the following documentation is required to process this request:
   a. Form 19 - Client Change Notice (clearly detailing the change);
   b. A proposed scope of accreditation.
3. Upon receipt of this information a determination is made by the appropriate L-A-B Program Manager as to the level of technical review necessary to process and approve this request.
4. Scope expansions may include a document review of data or an onsite visit performed by competent personnel.
5. Scope expansion by document review will be performed by technically competent L-A-B staff or TAG. All necessary documentation will be requested from the lab and available for review.
6. Where an Assessor(s) is to perform an onsite technical competence evaluation for a scope expansion this process it is to be treated the same as the initial/full re-accreditation.
7. All scope expansion technical reviews are to be treated the same as the regular assessment technical review process defined above.
8. Scope expansion desk reviews will typically be documented on the Form 218.8 but may also utilize the Form 218.1.

Monitoring

1. Technical Review Process

   L-A-B will maintain a technical tracking report detailing the technical review status of the technical package retuned to L-A-B after each assessment. Technical package review will be monitored using this form and thru weekly meetings to assure reviews are completed in a timely manner. At anytime a Technical Review may be taken away from a TAG Member to ensure its integrity and timely review.

2. TAG Reviewer Monitoring and Approval

   L-A-B Technical Staff conducts monitoring of the approved TAG Technical Reviewer through Form 209.3 to ensure the performance is satisfactory and appropriate for the actions identified to improve the process. The TAG Technical Reviewer will be evaluated on an annual basis unless there is sufficient supporting evidence that the L-A-B Technical Reviewer is continuing to perform competently.

RECORDS

Form 19 – Client Change Notice

Form 209.3 - Assessor / Technical Expert / TAG Reviewer Evaluation Summary and Approval

Form 218 – Technical Review Allocation

Form 218.1 - Technical Package Compliance Report

Form 218.2 - Scope of Accreditation Ballot Review

Form 218.8 – Desk Review Allocation

L-A-B Assessor Handbook

Revision History

Revision Level	Revision Date	Revised By	Brief Description of Revision
Original Issue	3/7/03	Lynne Neumann	Original Issue
Rev. 1	8/4/03	Lynne Neumann	Added approval indications for Form 218.1.
Rev. 2	11/5/03	Lynne Neumann	Modified to represent appropriate current practices
Rev. 3	3/19/04	Ryan Fischer	Included the balloting system in the Scopes of Accreditation
Rev. 4	10/22/05	Linda Mumma	Revised to include ISO/IEC 17011 requirements
Rev. 5	01/23/06	Jason Stine	Revised to reflect new review process
Rev. 6	07/18/06	Jason Stine	Added to section 4: The L-A-B reviewer will be independent from the assessment. Added to section 5: If the L-A-B reviewer is not technically competent to review the findings from the surveillance visit it will be sent out to the appropriate TAG member for review. Added to section 6: If the Chief Technical Officer or Managing Director performed the assessment the approval will be made by the L-A-B Testing or Calibration Manager. Added Monitoring section.
Rev. 7	08/25/06	Doug Leonard	Added Reference to Assessor Instruction Manual. Added section 3.
Rev. 8	10/8/07	Ryan Fischer	Restructured the contents of the SOP to account for a Initial/Reassessment, Preliminary/Surveillance, Scope of Accreditation review and Scope Expansion. Additionally added area for sending out a Technical Review Allocation to the TAG member for the purposes of self declaration and time commitment.
Rev 9	06/11/08	Linda Mumma	Updated to reflect current Operations staff titles and positions
Rev 10	06/02/10	Jason Stine	Complete revision to reflect current technical review process
Rev 11	08/20/10	Doug Leonard	Updated monitoring area to include TAG Technical Reviewer and removal of Scope Balloting form which is now part of the technical review form(s) and update scope expansion section for on-site witnessing requirements to be treated the same as an initial/re-accreditation.

APPROVED: _____ **DATE:** **08/20/10**

Vican Electronics

Victor Kuczynski

Employment

1987 – Present

I am President and CEO of my own consulting company, Vican Electronics, located in Toronto, Ontario, Canada.
Vican Electronics provides design and EMC services and is involved in development of various products in areas like medical, telecommunications, industrial control, RF and microwave, power electronics, high speed data communications, digital TV and HDTV, broadcasting, automotive, military, information technology and instrumentation's.
Vican Electronics is specializing in pre-compliance and compliance EMC testing and by incorporating EMC design principles and techniques into the product development process is able to provide solutions for products or systems that will meet worldwide EMC compliance, especially in emission and immunity as well wireless, automotive and telecommunications.
Participating in the EMC standards development provides additional benefit to my customers.

1983 – 1986
I was working in Poland and England on various projects in the area of switching power supplies and industrial electronics.

Education

1979 - 1983 *Technical University of Warsaw, Poland*
Major Course Electronics Engineering
MSEE Degree, March 1983

1973 - 1978 *Technical University of Gdansk, Poland*
Major Course Radiocommunications

Accreditation's

NARTE certify EMC Engineer, certifications NR: EMC-002208-NE

Professional memberships

- *Member of ANSI accredited C63 SC 1, SC 6 and SC 8 since 1996*
- *IEEE member since 1987, EMC Society, Antenna Theory, Microwave Theory and Techniques, Instrumentation and Measurement, Communications Society and others*
- *Technical Expert in EMC laboratory accreditation for NIST under NVLAP program*
- *Member of CSA EMC standards development , chair of CSA 577 Committee on EMC*

Patents and publications

US Patent # 5640129 , Canadian Patent # 2098636

LABORATORY ACCREDITATION BUREAU

Assessor Biography

Name: Victor Kuczynski

[redacted]

Education and Work History

Assessment Related History

Summary

Mr. Victor Kuczynski is also NVLAP assessor since 2002 and President of his own consulting company, Vican Electronics, since 1987. He provides consultations, training and other EMC related services including design and troubleshooting.

Work History and Relevant Work Experience

Mr. Kuczynski as the President of Vican Electronics has been involved in development of many projects in the medical, industrial, telecommunications, RF and Microwave, broadcasting, automotive, military, transportation, information technology, power electronics and instrumentations areas. This includes laboratory consultations, troubleshooting, measurements and testing, calibrations, training and quality management system implementations and maintenance.

From 1983 till 1986 he was working in Poland and England on various projects in the area of switching power supplies and industrial electronics.

Other Activities

Mr. Kuczynski participates in ANSI accredited C63 standard development comity since 1996. He has been a member of SC1, SC3, SC6(Chair) and SC8. SC 6 provides resources for laboratory accreditation activities. He has been an IEEE member since 1987, EMC Society, Antenna Theory, Microwaves Theory and Techniques, Instrumentation and Measurement, Communications Society and others. He is a chair of the CSA Standards Development Comity TC 577 on EMC.

He is also a NARTE certified EMC engineer (certification No: EMC-002208-NE) and Technical Expert in EMC laboratory accreditation for NIST under the NVLAP program.

Education, Skills, and Proficiencies

Mr. Kuczynski has received MSEE from Technical University of Warsaw, Poland in 1983.
He holds US patent (# 5640129) for switching RF generator and modulators and is proficient in Polish.

David James Zimmerman
[redacted]

Professional Experience

TÜV SÜD America
New Brighton, MN

Chief Technical Advisor – EMC/Aerospace *February 2004 to February 2011*

Duties and responsibilities include: Provide engineering support for immunity and emissions testing and act as the primary technical EMC/Aero resource. Provide relevant training for EMC testing. This includes class work and hands-on applications. Training processes also include keeping current with licensures and relevant accreditations. Write EMC test procedures for clients. Provide EMC consulting services on an as needed basis. Provide technical assistance for the sales and marketing staff in the area of EMC related topics. This includes participating in sales calls, tradeshow representation, and industry participation.

Lockheed Martin
Eagan, MN

EMC Engineer Sr. *September 2003 to February 2004*

Duties and responsibilities include: The technical operation of the EMC test facility, including purchasing of test equipment, keeping current calibration records of test equipment, keeping current on all relevant Military Standards. Speaking with customers regarding testing methodology, proper equipment configuration, and interpretation of Military Standards. Mitigation of EMC problems and the design of EMC countermeasures for use on customers' products, which include the use of shielding, filtering, grounding, gasketing, and proper PCB layout. Performing emissions and immunity testing and completing the proper documentation per requirements called out in Military Standards. Reviewing EMC test plans and procedures. Reviewing EMC test reports.

TÜV America Inc.(formerly Amador Corporation)
New Brighton, MN

Chief EMC Engineer *January 2001 to September 2003*

Duties and responsibilities include: The technical operation of the EMC test facility, including purchasing of test equipment, keeping current calibration records of test equipment, keeping current on all relevant EN, ISO, RTCA, and Military Standards, and supervision of the technical staff. Speaking with customers regarding testing methodology, proper equipment configuration, and interpretation of EN, ISO, RTCA, and Military Standards. Mitigation of EMC problems and the design of EMC countermeasures for use on customers' products, which include the use of shielding, filtering, grounding, gasketing, and proper PCB layout. Performing emissions and immunity testing and completing the proper documentation per requirements set out in EN, ISO, RTCA, and Military Standards. Training EMC department employees in the use of proper EMI reduction techniques. Training the technical staff in emissions and immunity testing per requirements set out in EN, ISO, RTCA, and Military Standards. Reviewing EMC data sheets, test plans and specifications. Reviewing EMC test reports. Holding weekly EMC department quality meetings at which solutions to quality problems are defined and then implemented. Verifying and improving semi-anechoic chamber field uniformity and attenuation.

EMC Test Engineer *July 1996 to January 2001*

Duties and responsibilities include: Performing emissions and immunity testing and completing the proper documentation per requirements set out in EN, ISO, RTCA, and Military Standards. Reviewing EMC test plans and specifications prior to testing. Speaking with customers regarding testing methodology, proper equipment configuration, and interpretation of EN, ISO, RTCA, and Military Standards. Mitigation of EMC problems and the design of EMC countermeasures for use on customers' products, which include the use of shielding, filtering, grounding, gasketing, and proper PCB layout. Holding weekly EMC department quality meetings at which solutions to quality problems are defined and then implemented. Training the technical staff in emissions and immunity testing per requirements set out in EN, ISO, RTCA, and Military Standards. Making recommendations for the purchase of test equipment,

EMC Technician *January 1991 to July 1996*

Duties and responsibilities include: Performing emissions and immunity testing and completing the proper documentation per requirements set out in EN, ISO, RTCA, and Military Standards. Reviewing EMC test plans and specifications prior to testing. Mitigation of EMC problems and the design of EMC countermeasures for use on customers' products, which include the use of shielding, filtering, grounding, gasketing, and proper PCB layout. Attending weekly EMC department quality meetings at which solutions to quality problems are defined and then implemented.

Apertus Technologies (formerly Lee Data Corporation)
Eden Prairie, MN

Associate Engineer *November 1989 to August 1990*

Duties and responsibilities include: Designing and implementing EMC countermeasures, which include the use of shielding, filtering, grounding, gasketing, and proper PCB layout. Writing Engineering Change Orders (ECOs) to incorporate changes in current product line to achieve FCC and VDE compliance. Scheduling, configuring, and testing of products for FCC and VDE compliance. Documentation of EMC testing results, including report writing.

Senior Electronics Technician *November 1984 to November 1989*

Duties and responsibilities include: Assisting the engineering staff in designing and implementing EMC countermeasures, which include the use of shielding, filtering, grounding, gasketing, and proper PCB layout. Writing (ECOs) to incorporate changes in current product line to achieve FCC and VDE compliance. Scheduling, configuring, and testing of products for FCC and VDE compliance. Documentation of EMC testing results, including report writing.

Systems Design Technician *July 1983 to November 1984*

Duties and responsibilities include: Assisting in the design, fabrication and reliability testing of prototype and production electronics. Also responsible for writing ECOs as needed to improve reliability of electronic products.

Electronics Technician *July 1981 to July 1983*

Duties and responsibilities include: The repair of printed circuit boards, system configuration and functional testing of minicomputers.

Education

Lightning Technologies Incorporated *6 – 10 December 1999*
Pittsfield, MA
Successfully completed a course in Lightning Protection of Avionics.

Lightning Technologies Incorporated *27 September 1999 to 1 October 1999*
Pittsfield, MA
Successfully completed a course in Lightning Protection of Aircraft.

St. Cloud Technical & Community College *June 1981*
St. Cloud, MN
Successfully completed a 2 year course in Instrumentation Technology, which included Electronics, Hydraulics, Pneumatics, Computer Control, Instrument Calibration, and Physics.

Albany High School *June 1979*
Albany, MN
Graduated with honors

Organizations

NARTE Certified EMC Engineer
Medway, MA – EMC-002420-NE - Member since 2002

Institute of Electrical and Electronics Engineers
Piscataway, NJ – 40195592 - Member since 1997

RTCA - SC-135
Washington DC - Member since 2004

Accredited Standards Committee C63® Electromagnetic Compatibility
Main Committee: Representing TUV-America, Inc. - Primary
Subcommittees: SC5, SC6-Secretary, SC8-Secretary
Working Groups: On-site testing (C63.24), C63.10/C63.26(Transmitter testing)
Member since 2004

LABORATORY ACCREDITATION BUREAU

Assessor Biography

Name:
Harry H. Hodes
[redacted]

Education

Mr. Hodes has a B.Sc. in Applied Physics (awarded in 1976, with a specialization in Meteorology and a minor in Statistics) from Rutgers University in New Brunswick, New Jersey. He completed the M.S. Program coursework in Electrical Engineering (with a concentration in Systems Engineering) at Johns Hopkins University in Baltimore, Maryland, and, the Masters in Engineering Administration (M.E.A.) Program coursework at George Washington University in Washington, DC. He is an iNARTE Certified EMC Engineer (Certificate #: EMC-003455-NE), and is a Member of the IEEE EMC Society. He regularly participates in formal continuing education activities, having completed 15 EMC-related "Short Courses since 2001.

Work History

Harry H. Hodes began his career as an EMC Engineer in 1977 at the DoD EMC Analysis Center [ECAC]. Over the next 15 years, he worked for a variety of Aerospace and Defense Contractors in progressively more responsible positions as an EMC Analyst, EMC Test Engineer, and EMC Systems Design Consultant. In 1992, at the end of the cold war, Mr. Hodes and four others pooled their retirement program funds and purchased the assets of SAIC's EMC/Tempest Test Lab. Renaming their business Electromagnetic Engineering Services Inc. ["EESI"], the five partners built the business from zero sales to $1.5 Million in commercial "CE Mark", FCC, RTCA DO-160, and MIL-STD-461 EMC testing within 5 years. At that point, they sold the Lab to NEMKO. After the purchase of EESI by NEMKO, Mr. Hodes served as a Principal EMC Test Engineer, and as an EMC Lab Assessment Auditor for NEMKO's worldwide network of EMC Labs.

After leaving NEMKO in 2000, Mr. Hodes was employed for several months as a full-time contractor at CCS in Sunnyvale California, where he managed the training of EMC Technicians and assisted with the planning for a new EMC Test Lab that was eventually built in Morgan Hill, California.

In December 2000, he formed Engineering & Technical Services Corporation, which is a small EMC consulting services firm located 25 miles from the US-Canada border in Bellingham Washington. Additionally, in December 2000, he purchased Acme Testing Company. Acme Testing Co. was a small (4 person) Third-Party Independent EMC Test Laboratory located 30 miles from the US-Canada border in Acme, Washington. After purchasing Acme Testing Co., he expanded its EMC Test Lab from its FCC and "CE Mark" ITE-only EMC Testing business base into a full-service EMC Test Lab employing ten people that provided EMC Testing services to manufacturers of a wide variety of Military and Commercial Aerospace Avionics Systems, as well as to the manufacturers of Heavy Industrial Equipment, Medical Devices, Marine Electronics, Lifts, Tugs, Powered Wheelchairs and other Assistive Devices, Industrial Process Control Instruments and Network Equipment, Ultra-high bandwidth Networking Appliances, UPS and other kinds of Power Conversion Equipment, Head-end Cable Network Devices, and In-flight Entertainment Systems. He served as Principal EMC Engineer (specializing in the EMC Test Planning and Testing of Naval and Commercial Marine Electronics Systems, Land Military and Commercial Land Vehicle Subsystems, and Commercial and Military Aircraft Mission Avionics), and as President/CEO of Acme Testing Co. until its closure in December 2012.

Since January 2012, he has been employed as the Technical Manager of ACE-PT Inc. (i.e., the ACIL Corporation for EMC Proficiency Testing, Inc.), and as such is responsible for all of ACIL's EMC Proficiency Testing [PT] Programs. In this role, he is responsible for the technical design and development of each of ACIL's EMC PT Programs, and for ensuring that the analysis procedures used during each of ACE-PT Inc.'s EMC PT Programs are rigorous and technically correct, and for the timely and correct formal publication of the results of each "round" of each of ACE-PT Inc.'s EMC PT Programs. He recently completed the process of obtaining IEC/ISO 17043:2010 Accreditation as an *EMC Proficiency Testing Provider* for ACE-PT Inc.

Assessment Related History

Mr. Hodes has significant expertise in the assessments of EMC laboratories that specialize in any or all of the following types of EMC tests: US FCC (47 CFR Part 15B and Part 18), Industry Canada (ICES-00x), EU EMC Directive "CE Mark"; Taiwan (BSMI), Japan (VCCI) V-3, Republic of Korean (KN EMC/EMS Standards), EU Automotive EMC Directive and US SAE J1113 Automotive, EU R&TTE Directive, EU Medical Device Directive and US FDA 510(k) PMN and PMA Submissions for Class II and Class III Medical Devices; Commercial Marine Navigation, Propulsion and Control Systems (IEC 60945 and Classification Society equivalents); Military EMC (i.e., MIL-STD-461 and DEF-STAN 59-411 for avionics, grounds systems, and naval combatant ship and submarine systems), and Commercial Aircraft EMC (i.e., RTCA DO-160). He has performed assessments in the USA, Taiwan, and in the UK.

Professional Activities

Since 2001, he has been an active member (and, since 2009, the Vice-Chairman) of the Conformity Assessment Section [CAS] of the American Council of Independent Laboratories [ACIL]. Additionally, he serves as the chief of the Editorial Board of the tri-monthly *ACIL EMC Standards Alert Newsletter* authored by Donald Heirman.

Additionally, Mr. Hodes is ACIL's Primary Voting Member on the Accredited Standards Committee C63, and has been active since 2008 in several ASC C63 SC1 and SC6 working groups, including the SC1 working groups that developed the soon-to-be published 2012 editions of ANSI C63.4 and ANSI C63.5. He was recently designated as Vice-Chairman of SC1, and was named to be the Lead Author of the SC6 working group that will eventually publish the ANSI C63.11 Guidance Document on Inter-lab and Intra-lab Proficiency Testing for EMC Test Laboratories.

He also serves as the EMC Subject Matter Expert [SME] to ANSI TC80, which is the US National Technical Committee of the IEC that is responsible for the development of Marine Navigation-related product Family Standards.

Finally, from 2010 to mid-2012, he served as one of several technical experts on the US Department of Justice [DOJ] Special Technical Committee for Offender Tracking Technology, which is now completing work on the first DOJ Standard for GPS-based Offender Tracking Systems.

03 July 2012

Detailed Resume of Harry H. Hodes

Education:

Graduate Studies:
Masters in Engineering Administration [M.E.A.] Program (Coursework Only, No Degree Awarded): George Washington Univ. (1982-1986)
M.S. Electrical Engineering (Instrumentation Systems) Program (Coursework Only, No Degree Awarded): Johns Hopkins Univ. (1981-1982)

Undergraduate Degree:
B.S. Applied Physics (Meteorology Specialization), Rutgers Univ. (1976) [Honors] - Awarded US Air Force Scholarship

Certifications:

He is am iNARTE Certified EMC Engineer (iNARTE Certificate # EMC-003455-NE).

Professional Society / Trade Association Memberships:

Member, Institute of Electrical and Electronics Engineers [IEEE] IEEE EMC Society
Member, American Council of Independent Laboratories [ACIL], Vice-Chairman, Conformity Assessment Section

Professional Activities:

- He is ACIL's Primary Voting Member of the Accredited Standards Committee C63 [ASC 63], as well as a member of two ASC 63 Subcommittees - i.e., SC1 (EMC Measurements) and SC6 (Lab Accreditation). Within those Subcommittees, he is an active member ofd several Working Groups, including the recently-formed SC6 working group that is developing the ANSI C63.11 Guidance Document on Inter-lab and Intra-lab Proficiency Testing for EMC Test Laboratories. Additionally, he is the Vice-Chairman of SC1.
- He is an ASC 63 SC1 Maintenance Team Member for two of the most important US Commercial EMC Standards - i.e. ANSI C63.4 (EMC Emissions Measurements) and ANSI C63.5 (EMC Antenna Calibration)
- He is the officially designated EMC Subject Matter Expert [SME] to ANSI TC80, which is the US National Technical Committee of the IEC that is responsible for the development of Marine Navigation-related Product Family Standards.
- He serves as Vice-Chairman of the Conformity Assessment Section of the American Council of Independent Laboratories [ACIL]. Also, he serves as the chief of the Editorial Board of the quarterly *ACIL EMC Standards Alert Newsletter* authored by the Chairman of IEC/CISPR (Donald Heirman).
- Between March 2010 and May 2012,, he served as one of several technical experts on the US Department of Justice Special Technical Committee for Offender Tracking Technology, which is developing the first US DOJ Standard for GPS-based Offender Tracking Systems.

Published EMC Paper:

In 1982, Harry H. Hodes was the lead co-author of a Paper published in the Proceedings of the National Aerospace and Electronics Conference (NAECON), held in Dayton OH by the IEEE. The Paper was entitled: "The solution of "Real-World" aircraft EMC problems using the AAPG computer program". (See NAECON Proceedings 18-20 May 1982, Volume 1, pgs 11-18)

Work History:

Current Position: **Consulting Engineer (01 December 2011 to Present)**
Current Contract Assignments:
a. American Council of Independent Laboratories [ACIL] and ACIL Corporation for EMC Proficiency Testing Inc. [ACE-PT Inc.].

He is the Technical Manager for all of ACIL's EMC Proficiency Testing [PT] Programs. In this role, he is responsible for: the technical design and development of each of ACIL's six current and two pending EMC PT Programs; for ensuring that the analysis procedures used during all of ACIL's EMC PT Programs are rigorous and technically correct; and, for the timely and correct formal publication of the results of each "round" of each *ACIL EMC PT Program Analysis Report.*

Additionally, he was responsible for the development of all of the Quality System documentation (including technical procedures) required to obtain ISO/IEC 17043:2010 Accreditation for all of ACIL's EMC Proficiency Testing [PT] Programs (which will be operated by the *ACIL Corporation for EMC Proficiency Testing Inc. [ACE-PT Inc.])*. He has been designated by ACIL as ACE-PT Inc.'s permanent PT Program Technical Manager for all of ACE-PT Inc.'s ISO/IEC 17043-Accredited EMC PT Programs.

b. American Association for Laboratory Accreditation [A2LA]

He is a contracted Assessor that specializes in performing ISO/IEC 17025 Assessments of EMC Test Laboratories.

Previous Positions:
Acme Testing Co. [Acme, WA] 02 December 2000 to 30 November 2011
Positions: Principal EMC Engineer, and President/CEO

In addition to his responsibilities as President/CEO, he served as Acme Testing Co.'s Principal EMC Engineer. As Principal EMC Engineer, he was responsible for the following:

- EMC Program Management: He was responsible for evaluating all incoming Military and Commercial aerospace EMC-related RFIs, RFQ, RFPs and ITTs in order: to analyze their content in such a way as to define EMC Testing and EMC Documentation Requirements (including the technical and format requirements for all EMC Control Plans, EMC Design Checklists, EMC Analyses, EMC Test Plans, and EMC Test Reports); to determine Acme Testing Co.'s Bid Strategy (including Teaming and/or subcontracting, as appropriate); to develop lists of

technical and administrative questions that required clarifications for clients prior to issuing quotations (and to send formal letters or informal e-mails requesting such clarifications); to identify any gaps in our equipment and/or software capabilities that would need to be filled through self-construction, rental or purchase in order to perform the work (and to perform make vs. rent vs. buy cost analysis of such items); to develop and document the formal Basis of Estimate (BOE) for all required EMC Testing and Documentation; and, to issue all Quotations for Military and Commercial Aerospace EMC-related Testing and Documentation. Additionally, after contract award, he was responsible for writing formal EMC Test Plans and MIL-STD-461 Tailoring Requests; managing test and documentation work schedules and budgets; reviewing draft invoices for Milestone Payments, Long-lead Procurement Items, and, Out-of-Scope Work; negotiating Change Orders; and, Briefing Clients and their Sponsoring Agencies on program status and providing formal presentations during PDRs and CDRs.

- Test Engineering: He served as the Supervisory Test Engineer for all military EMC tests (i.e., MIL-STD-461 A/B/C/D/E/F, MIL-STD-704E, MIL-STD-1399-Section 300A, and British DEF-STAN 59-41 and 59-411) and for all RTCA DO-160D/E/F commercial aerospace EMC Tests performed at Acme Testing Co. and at other (subcontracted) EMC Test Labs. In this role, he performed and documented (or closely supervised the performance and documentation of) the EMC tests in accordance with the applicable Contract Documents [i.e., Quotation(s), and/or Test Plan(s), and/or applicable Test Specification(s)/Standards(s), CDRL Items and/or DIDs, as applicable]; issued formal EMC Test Reports and/or released test data (plots and tables) under a formal Letter of Transmittal. Additionally, He was responsible for leading all EMC-problem Mitigation Engineering activities on military and commercial aerospace EMC projects. These efforts included such activities as: performing MIL-STD-461 and RTCA DO-160 EMC Evaluation Tests on various prototype equipments; evaluation and validation of the shielding, bonding, grounding, and EMI filtering design implementation of the equipments being tested and their inter-connecting and intra-connecting cables; evaluation of EMI problems potentially caused by internal cable placement within an equipment; analysis of EMI problems that were suspected to be caused by inter-modulation products or harmonics; and, root-cause analysis of both radiated and conducted susceptibility test failures (especially those relating to pulse transient effects).

-Quality Management: Specifically, he established the overall quality policy, and ensured that the quality function remained insulated from undue influence and/or pressure emanating from clients and/or the Technical Operations Department. To those ends, he ensured that the quality system was implemented and maintained in accord with the Quality System Manual, and through audits, that the company continued to meet the ANS/ISO/IEC 17025:2005(E) and ISO 9001:2008 requirements. He also developed and implemented a sophisticated Calibration and Repair system based upon two programs - i.e., a workload-based Scheduled Preventative Maintenance Program [SPMP] and an Inspection and Repair Necessary [IRAN] Program. Additionally, he managed the Acme Testing Co. EMC Technical Training Program. (This program included a highly structured, career-path oriented training syllabus for both EMC Test Technicians and EMC Test Engineers that included classroom training, OJT, and practical qualification test examinations on: Test Standards/Specifications, Test Methods and Procedures, proper test documentation procedures and content, and, professional standards). Also, he had an ongoing responsibility to review existing, new, or amended test standards and/or test plans to ensure that Acme Testing Company did not accept work for which it was not adequately equipped and/or for which the staff was unqualified to perform. Additionally, he was the final reviewer and signatory authority for all Test Reports issued by Acme Testing Co. Finally, he was responsible for developing all documentation for, submitting to, and coordinating with all Accrediting Bodies [ABs] (i.e., A2LA and SAI Global), national approving authorities (e.g. the US NIST, the US FCC, Taiwan's BSMI, South Korea's KCC and RRA, and Japan's VCCI), various European Union Notified Bodies [NBs] (such as the UK Vehicle Certification Authority and Norway's NEMKO AS, etc.) on matters relating to Facility Audits and/or Filing Packages for Facility/Site Accreditations, Registrations, and/or CAB Designations and CAB Designation Renewals. It is especially noteworthy that under his leadership, Acme Testing Co. was ANS/ISO/IEC 17025:2005(E) Accredited by A2LA for a Scope of Accreditation that included more than 150 different EMC Test Methods inclusive of MIL-STD-461 and DO-160. (Acme Testing Co.'s A2LA Accreditation was legally recognized by, among others, the US Navy, the US FCC, the US FAA, and the US FDA).

-Third-Party Product Certification: he was the Senior Technical Manager responsible for technical review of all client requests for 2004/108/EC EMC Directive Notified Body Letters of Opinion. He performed all technical reviews of client-provided Technical Files, supervised the production of, and acted as the signatory for, all 2004/108/EC EMC Directive Notified Body Letters of Opinion issued by Acme Testing Co.

-Technical Leadership: In order to maintain currency, he analyzed newly issued and pending EMC Specifications/ Standards/Technical regulations issued by the US DoD, US FCC, the US FDA, Industry Canada, ANSI, IEEE, TIA/EIA, IEC, CISPR, ISO, Japan's VCCI, Taiwan's BSMI, Korea's KCC and RRA, Australia's ACMA, as well as all of the European Union (CE Mark) EMC-related EuroNorms issued by CENELEC and ETSI. Additionally, he maintained currency by annually attending a series of meetings (e.g., IEEE EMC Symposium, SAE AE-4 Meetings, TCB Council Seminars, Meetings and Accredited C63 Standards Committee-sponsored Training Courses, etc.). He then distilled this information and provided both formal and "OJT" training to the Technical Staff at Acme Testing Co. Additionally, he worked closely with the Vice President/General Manager and the Quality System Manager to develop new test procedures and test report templates. He also directed Acme Testing Co.'s capital equipment and capital facilities planning and budgeting processes.

As President/CEO, he was responsible for ensuring the ongoing viability of the business by structuring available resources (both people and financial) so as to remain focused on business necessities. To that end, he closely supervised all of the company's accounting functions (i.e., AR, AP, invoicing) and financial controls (i.e., P & L, Balance Sheet, Key Ratios, etc.). Additionally, he was responsible for Acme Testing Co.'s strategic planning activities in the areas of new line-of-business development, competitive positioning, arranging teaming and subcontracting relationships, and (especially) in the area of capital equipment/facilities requirements planning. He also participated in the marketing activities of Acme Testing Co. by giving Seminars to prospective and current clients, and by enhancing industry awareness of Acme Testing Co. through active participation in various Professional Society activities.

Compliance Certification Services ["CCS"] [Sunnyvale, CA] April to October 2000
Position: Principal EMC Engineer

He served as a full-time in-house consultant to the CCS EMC Department, and also served as its acting EMC Lab Manager. In these roles he was responsible for: the daily operational supervision of the EMC Department's test personnel; providing in-depth EMC technical education and training to the EMC test personnel; performing QA reviews and Audits of CCS's EMC Test Equipment and Facilities and the results of its

commercial EMC tests (on a project-by project basis); providing consulting and test planning to Clients in respect to EMC-related SEMI S2 requirements and FCC Part 18 approvals; supervised Radio Transmitter and Receiver Emissions and Immunity Tests per ETSI Standards and per FCC Parts 15C, 90, and 101; and, acted as CCS's Project Engineer for the design phase of the new EMC RF Anechoic Chamber and other test facilities that were being built at CCS' Morgan Hill, CA location.

Nemko EESI, Inc. ["Nemko EESI"] [San Diego, CA] 1998 – March 2000
Position: Chief Engineer and Manager for Administration and Planning

After the purchase of EESI by Nemko USA, he was solely responsible for:

- providing formal Seminars to USA and Overseas Clients in the following areas: a) on the current and future worldwide EMC regulatory and technical requirements that apply to their specific product lines, b) on the specific practices and procedures that are required to correctly perform a variety of EMC Test Methods, c) on EMC Laboratory Operations topics such as the practical computation of Measurement Uncertainties in EMC Tests, and the practical requirements that need to be met to demonstrate Calibration Traceability;
- performing, on behalf of the worldwide Nemko Group, EMC Lab Accreditation Audits (in several Asian nations and the USA) of "third party" (i.e. independent) EMC Labs and of manufacturer's in-house EMC Labs ;
- negotiating and coordinating the technical scope of EU EMC Directive Technical Construction File [TCF] testing on large industrial machines subject to SEMI S2 requirements;
- negotiating and coordinating the technical scope of radio testing being performed under the EU EMC Directive and the pending RTTE Directive and EU National Requirements (i.e. both EC Type Examination and various National Type Approvals) with Nemko AS [Norwegian Notified Body and Competent Body];
- being up-to-date on the status and scope of all current and pending significant EMC Standards issued by the US FCC, Industry Canada, Japan's VCCI, the US FDA, ANSI, IEEE, TIA/EIA, IEC, ISO, and, all of the European Union (CE Mark) EMC EuroNorms issued by CISPR, CENELEC, and ETSI;
- performing requirements analysis on all newly acquired EMC Specifications and Standards to determine if EESI's existing instrumentation and facilities resources are adequate to perform the required tests to the required levels or limits;
- writing, negotiating, and reviewing formal EMC Test Plans and formal EMC Test Protocols on all projects involving the EMC Testing of life-safety critical or mission-critical systems. (These Projects included MIL-STD-461 Tests on USAF and US Navy Core Avionics Systems, RTCA DO-160 Tests on Cockpit Head-up Displays and In-flight Mission Awareness Systems, and IEC 60601-1-2 Tests on Class 2 and Class 3 Medical devices).
- writing, negotiating, and reviewing the Technical Statement of Work and all related Purchase Orders [and/or Contracts and PO/contract amendments or Change Orders] for European Radio Approvals (i.e. ETSI /EN 300 Series) Tests, Automotive EMC Tests, and military/commercial aerospace Radio Tests, and Class3 Medical Devices;
- providing "in-house" Technical Training (both in seminar format and in "OJT" format) to the EMC Test Technicians and EMC Test Engineers whenever new instrumentation was acquired or whenever a significant change to a Basic EMC Test Standard occurred;
- serving as a "technical umpire" between Clients and Nemko EESI Staff (to resolve disputed interpretations of Specifications and to answer complex Test Method questions);
- serving as a Supervisory EMC Test Engineer whenever Nemko EESI received a contract to perform unusual, highly complex or potentially dangerous EMC Tests;
- developing all documentation for, submitting to, and coordinating with all national approving authorities (e.g. FCC, VCCI, various Competent Bodies, etc.) on Facility Audits, Facility/Site Accreditation and/or Registration Package Filings;
- managing Nemko EESI's Quality System Program;
- designing, specifying, contracting for, installing, integrating, and making operational Nemko EESI's 200 V/m [10 kHz – 18 GHz] RF Anechoic Chamber-based automated testing capability; and,
- designing, specifying, contracting for, installing, integrating, and making operational Nemko EESI's 1.2 X 3.0 X 1.0 metre [useable height X useable length X usable width] Parallel Plate testing capability.

Electromagnetic Engineering Services, Inc. ["EESI"] [San Diego, CA] – 1992-1998
Position: He co-founded EESI in 1992 (by buying the assets of SAIC's EMC/TEMPEST Division) and served as its first President. In 1995, He became Principal Engineer and VP for Administration and Planning). In 1997 and 1998 he was a key member of the 4-man team that negotiated the sale of EESI to the Norway-based Nemko Group. In particular, he was responsible for developing the details of the Buy-Sell Agreement and the post-sale "Key Man" Employment Contracts for senior staff members.

As a Technical Manager, he was solely responsible for:

- developing and issuing all of EESI's combined Technical and Cost Proposals for EMC and for accepting or negotiating all Purchase Orders and Contracts (and PO/contract amendments or Change Orders);
- writing, negotiating, and reviewing formal EMC Test Plans and formal EMC Test Protocols on all projects involving the EMC Testing of life-safety critical or mission-critical systems. (Note: these Projects included MIL-STD-461 Tests on the USAF B1-B Fire Warning System, and on a series of US Army Tactical Fire Control Computers, and, on a US Navy RADIAC Set. Additionally, these projects included RTCA DO-160 Tests on a Full Authority Digital Engine Controller (FADEC); and, IEC 60601-1-2 Tests on Class 2 Infant and Adult Ventilator Systems).
- providing formal and informal Seminars to USA and Overseas Clients on the current and future worldwide EMC regulatory and technical requirements that apply to their products;
- being up-to-date on the status and scope of all current and pending significant EMC Standards issued by the US FCC, Industry Canada, Japan's VCCI, the US FDA, ANSI, IEEE, TIA/EIA, IEC, ISO, and, all of the European Union (CE Mark) EMC EuroNorms issued by CISPR, CENELEC, and ETSI;

- performing requirements analysis on all newly acquired EMC Specifications and Standards to determine if EESI's existing instrumentation and facilities resources are adequate to perform the required tests to the required levels or limits.
- defining the specifications and the capital facilities and capital equipment costs for all new facilities and new instrumentation to be acquired by EESI, and, managing the acquisition/construction, installation, checkout, calibration, integration and initial operation of all new facilities and new instrumentation obtained by EESI;
- providing "in-house" Technical Training (both in seminar format and in "OJT" format) to the EMC Test Technicians and EMC Test Engineers whenever new instrumentation was acquired or whenever a significant change to a Basic EMC Test Standard occurred.
- serving as a "technical umpire" between Clients and EESI Staff (to resolve disputed interpretations of Specifications);
- serving as a Shift Supervisory EMC Engineer and/or EMC Test Engineer when EESI's workload demands full-time second shift operations;
- developing all documentation for, submitting to, and coordinating with all national approving authorities (e.g. FCC, VCCI, various Competent Bodies, etc.) on Facility Audits, Facility/Site Accreditation and/or Registration Package Filings;
- administering EESI's Calibration Program, and EESI's Quality System Program.

He was also personally responsible for the design, construction, and calibration of EESI's Open Area Test Sites # 1 and # 2, EESI's 9 metre long Hybrid (RF Absorber-lined with Ferrite Tile underlayments) RF Anechoic Chamber, and EESI's two large indoor Ground Planes. Additionally, he successfully completed: a) two separate completely approved 3 metre/10 metre Open Area Test Site/Conducted Emissions Test Site FCC Filings (of EESI); b) NIST/NVLAP Accreditation of EESI; c) VCCI Registration of EESI; d) NAMAS Accreditation of EESI (through a Mutual Recognition Agreement with SGS UK Ltd); e) NEMKO Accreditation of EESI (by direct Audit); and f) 17 separate Supplier Audits of EESI (to QS-9000/ISO-9001/ISO Guide 25/ANSI-NCSL Z540-1). During his tenure, he also personally developed and issued more than 1,400 detailed Technical Proposal and Test Plans that were subsequently executed by EESI (and several other EMC Laboratories).

Science Applications International Corporation [San Diego, CA] - 1989 to 1992
Position: Principal Engineer, EMC/TEMPEST Laboratory Division

He served as the Principal Engineer for advanced development activity in the areas of: Electromagnetic Test Facilities (EMTFs) for aircraft radars, EW systems, and C3I Systems; real-time data collection systems (including telemetry, instrumentation and data acquisition computers) and multilateration based Time/Space Position Indicating (TSPI) Systems. His primary assignments involved Radar/EW/Systems-level EMC, EMC Field Surveys to determine the availability of interference free channels for telemetry systems and command and control systems, and, TSPI, EMTF project engineering and business development efforts in both the domestic and international marketplaces [including the UK, Taiwan R.O.C., South Korea, Israel, Spain, the Federal Republic of Germany, and Turkey]. Additionally, as a result of specific contracts, he provided extensive on-site EMC-related Systems Engineering and Technical Assistance [SE/TA] Support in the above areas (in the roles of both Principal Engineering Advisor, and "Tiger Team" Leader) to a variety of client firms and government agencies in the USA, the UK, Spain, and Turkey.

Additionally, he was responsible for the specification, architecture development and design, and systems engineering of Anechoic chamber-based whole-vehicle type EMC/Interoperability and Radar/EW Integrated Test Laboratory Instrumentation Systems, and Planar Near-Field Antenna Pattern Test Ranges. He also provided EMC Testing and Consulting Services for fielded computer systems and networks, and for developmental systems integration projects (in support of various newly developed "glass-cockpit" avionics and computer systems intended to be installed into aircraft, helicopters, and land vehicle systems.

United Technologies [San Diego Operations] (1986 - 1989)
Advanced Systems Division (1989) Position: Senior Consulting Staff Engineer
Advanced Systems Division (1988) Position: Chief of the Avionics Laboratory
Norden Systems Division (1986-1988) Position: Supervisor, Terminal Seekers & Sensors Branch.

Position: Senior Consulting Staff Engineer to the Avionics Department. In this role, his assignments included: the specification and design of a "Propagation Effects Test Set" (PETS) that emulated various meteorological and man-made RF propagation anomalies (including multipath, noise, Rayleigh fading, modeing-induced frequency instability, phase "hits", and jamming) that can affect the performance of a Ku-Band digital missile transponder data link; and, performing the Systems Integration Testing, EMC Testing, Environmental Testing and Flight Testing of a new airborne radar system for an RPV.

Prior to his service as Senior Consulting Staff Engineer, he served as Chief of the Avionics Laboratory, where his primary responsibility was the specification, design, facility construction, development, integration and operation of a new $2.4M system/subsystem simulation and integration laboratory (SSIL) in only 10 months. This highly secure, classified laboratory facility was used for real-time, all-software and hardware-in-the-loop missile system and aircraft radar and avionics subsystems integration activities and for mission software development. This laboratory supported a joint US-Israel government missile and radar program; as Laboratory Chief, he managed a staff of 15 engineers, and was continuously involved in technical and financial negotiations with the foreign and US government customers.

Position: Supervisor, Terminal Seekers & Sensors Branch. While supervising a staff of six engineers, his primary technical responsibility was to act as the Chief Engineer on a major segment of a tactical missile system development project. The project segment directed by him achieved the conceptualization, detailed design, full scale development, and operation of a large (170,000 lines of ADA code), extremely complex engineering proof-of-concept simulation of a pair of new, state-of-the-art airborne radars (i.e. JSTARS and MMRS) and their (new) associated air-to-ground missile system. After completing the large-scale proof-of-concept simulation, he supported the specification and development of a real-time Hardware-In-The-Loop (HWIL) simulation of the same system. During this period, he also directed a series of RF Anechoic chamber-based Radar Cross-Section (RCS) tests and analyses on full sized and scale-models of the same missile.

As an individual contributor to the project, he was responsible for: the algorithm design and flight testing of a variety of Synthetic Aperture Radar [SAR]-based ultra-high resolution non-cooperative target identification Modes within the AN/APQ-76 Multi-Mode Radar System [MMRS].

Additionally, he developed a series of algorithms for predicting long range RF propagation at X-Band and Ku-Band (including the effects of weather losses, spherical earth multipath, 4/3 radar earth effects). He was also responsible for phenomenological analysis and modeling of the radar cross-sections of certain ground targets and air vehicles, the development of a detailed set of simulation-based radar error models for various SAR high resolution and weapon delivery radar modes, the design of an MTI Association Algorithm, an Optimal Beam Bias Algorithm, and a Kalman Filter Track File Management module.

Firm: System Planning Corporation [Arlington, VA] (1983-1986)
Position: Senior Systems Engineer:

Primary responsibilities included direction of all of SPC's Meteorological Radar projects (in his assignment as the Director of Meteorological Radar Programs on SPC's 405 MHz Wind Profiling Radar design team). His responsibilities included extensive pre-proposal sales efforts, proposal development, technical interface with potential customers; providing education and training (hardware, software and operations) to sold customers; coordinating and executing acceptance testing; all EMC matters (including EMC testing, submittal and coordination of the FCC Type Acceptance Filing; and, the Site Licensing Filings for each radar); and, field installation site management. He was also responsible for performing the systems analysis, specifications development, detailed system design, integration and subsequent operations planning of the SPC MK III Series of radar cross-section (RCS) measurement system radars and their associated RCS anechoic chambers ("indoor ranges") or outdoor RCS ranges. These tasks were carried out during his assignments as Project Engineer on 4 different RCS range development contracts. As an individual contributor, he was responsible for: ISAR Imaging radar calibration; analysis of target and clutter phenomenology; RCS test planning; and the analysis of 2-D ISAR images of exotic targets. Prior to his promotion to Senior Systems Engineer (in 1984), he served as the lead engineer on a variety of projects including: the design of a low-loss CFAR Processor that is autoadaptively optimal in both Log-Normal and Weibull Clutter; the design of a SAR radar signal processing chain (mode) for the detection and classification of rotating antennas; the design and fabrication of an RF propagation anomaly measurement system; the analysis of site climatology data to support radar range and communication link site planning and installation; the mathematical analysis of high spatial and temporal resolution sea-clutter measurements; and, planning and making VHF one-way antenna pattern measurements using a balloon-borne source and the receiver-portion of a radar to measure a 65,000 lb., 60 ft diameter parabolic dish antenna system mounted 400 ft in the air on a gantry.

Firm: American Systems Corporation [Annandale, VA] (1982-1983)
Position: Systems Engineer.

Primary responsibility was the management of electrostatic discharge (ESD) control and ESD device sensitivity testing and analysis in support of the TRIDENT Submarine ESD control program. Additional responsibilities included a variety of "Quick Fix" electromagnetic compatibility (EMC) engineering efforts for NAVSEA in the areas of AN/AWG-9 radar interoperability with the avionics on the F-14B, HF radio interference to Gas Turbine Engine Controllers on FFG-7 Class Frigates, and EMI problems with Magnetic Anomaly Detection equipment caused by the AN/APS-120B Radar.

Firm: IIT Research Institute (IITRI) staff at DoD Electromagnetic Compatibility Analysis Center [Annapolis, MD] (1977-1982) Position: Project Engineer and Manager:

Primary responsibilities were a wide variety of Electromagnetic Compatibility [EMC] research and development projects for the US Air Force, US Navy, and US Army. These primary tasks included: a) development of the "AAPG" Computer Code (87,000 line of Fortran 77) that employed Uniform Theory of Diffraction [UTD] and a very realistic aircraft geometry processor so as to allow a user to very accurately predict the isolation between antennas on an aircraft as a function of location and frequency. [Note: AAPG software package is still the "Gold Standard" software used by the US, Canadian, and NATO military forces and Aerospace Prime Contractors for Antenna-Coupled EMC Analysis. Its most recent uses were on the F-22 and F-35 Fighter Programs]; b) development of a comprehensive set of Stockpile-to-Target Sequence (S-T-S) EMC Environment Definitions for various US Air Force air-launched tactical missile systems (e.g. Sidewinder, AMRAAM, Maverick, etc.), their delivery aircraft and their targets; c) working as an EMC Test Engineer on the Missile EW/Interoperability EMC testing of various US Air Force air-launched tactical missile systems; and d) designing and performing MIL-E-6051D Systems-level EMC tests on a series of Electro-explosive devices [EEDs]. His additional responsibilities included the evaluation of microwave Line-of-Sight [LOS] links to determine path availability, circuit reliability, and the effects of angle diversity configurations; the analysis of weather-related EMC effects (i.e. precipitation static, corona discharge and lightning strike effects) on aircraft radars, radomes and communications equipment; and, performing a detailed analysis of the connectivity of the US Army's Field Artillery Meteorological Data Acquisition System (FAMAS) to the TACFIRE Network under severe combat and ECM stress loads; and, instrumentation system design and test planning in the areas of MMW, infrared and optical propagation through dispersive media.

2009

Richard J. Reitz

Richard has over 25 years experience in the EMC testing field. He holds a BSEET from the State University of New York, College of Technology at Farmingdale where he graduated as Valedictorian of the Class of 1989. He has worked in all aspects of an independent EMC testing laboratory including test technician, test engineer and laboratory supervisor. He is currently the Corporate Laboratory Manager fo[redacted] Testing Laboratories where he has been employed since December of 1983. Richard is a NARTE Certified EMC Accredited Test Laboratory Engineer and a Senior Member of the IEEE. Richard is thoroughly familiar with the requirements for EMC accreditation, through personal experience as a laboratory manager, his continued involvement in NACLA and through his chair position on the ACIL EMC Laboratory Accreditation Task Force, which developed the program necessary for NVLAP to expand their scope of accreditations to include immunity test methods in support of the US-EU MRA.

Richard has extensive knowledge of the EMC industry and has served and continues to serve on numerous industry committees, including:

Philadelphia Chapter IEEE EMC Society, Executive Committee
ACIL EMC Committee, Chair
United States Council of EMC Labs (USCEL), Immediate Past Chair
ACIL Conformity Assessment, Chair
ACIL Board of Directors
NACLA Board of Directors, Secretary

[redacted]

APLAC[1] MEMBERSHIP

Full Members

Australia	National Association of Testing Authorities, Australia (NATA)[3, 12]
Brunei Darussalam	Ministry of Development (Construction Planning and Research Unit)
Canada	Standards Council of Canada (SCC)[3, 9]
	Canadian Association for Laboratory Accreditation Inc. (CALA)[3, 6]
	Quality Management Program – Laboratory Services (QMP-LS)
People's Republic of China	China National Accreditation Service for Conformity Assessment (CNAS)[3, 11]
Hong Kong, China	Hong Kong Accreditation Scheme (HKAS)[3, 11]
India	National Accreditation Board for Testing & Calibration Laboratories (NABL)[3, 9]
Indonesia	Komite Akreditasi Nasional - The Accreditation Body of Indonesia (KAN)[3, 4]
Japan	Japan Accreditation Board (JAB)[3, 8]
	International Accreditation Japan (IAJapan)[3, 13]
	Voluntary EMC Laboratory Accreditation Center (VLAC)[3, 6]
Republic of Korea	Korea Laboratory Accreditation Scheme (KOLAS)[3, 5]
Malaysia	Standards Malaysia (SM)[3, 9]
Mexico	Entidad Mexicana de Acreditación, a.c. (ema)[3, 8]
Mongolia	Mongolian Accreditation System (MNAS)[2, 5]
New Zealand	International Accreditation New Zealand (IANZ)[3, 8]
Pakistan	Pakistan National Accreditation Council (PNAC)[3, 5]
Papua New Guinea	Papua New Guinea Laboratory Accreditation Scheme (PNGLAS)[3, 6]
Peru	National Institute for the Defense of Competition and the Protection of Intellectual Property (Indecopi)
Philippines	Philippine Accreditation Office (PAO)[3, 5]
Russian Federation	Association of Analytical Centers, Analitica (AAC)[3, 6]
Singapore	Singapore Accreditation Council (SAC)[3, 8]
Sri Lanka	Sri Lanka Accreditation Board for Conformity Assessment (SLAB)[3, 9]
Chinese Taipei	Taiwan Accreditation Foundation (TAF)[3, 8]
Thailand	Department of Medical Sciences, Ministry of Public Health (DMSc)[3, 10]
	Department of Science Service (DSS)[3, 6]
	NSC-Office of the National Accreditation Council (NSC-ONAC)[3, 4]
United States of America	American Association for Laboratory Accreditation (A2LA)[3, 11]
	ANSI-ASQ National Accreditation Board LLC dba ACLASS (ACLASS)[3, 13]
	American Industrial Hygiene Association (AIHA-LAP, LLC)[3, 6]
	International Accreditation Service, Inc. (IAS)[3, 4]
	Laboratory Accreditation Bureau (L-A-B)[3, 5]
	National Voluntary Laboratory Accreditation Program (NVLAP)[3, 5]
	Perry Johnson Laboratories (PJLA)[3, 5]
Vietnam	Bureau of Accreditation (BoA)[3, 4]
Australasia	Joint Accreditation System – Australia & New Zealand (JAS-ANZ)[7]

Associate Members

Australia	Proficiency Testing Australia (PTA)
Bangladesh	Bangladesh Accreditation Board (BAB)
Republic of Korea	Korea Testing and Research Institute (KTR)
	National Institute of Environmental Research (NIER)
	Radio Research Agency (RRA)
	Korea Association of Standards & Testing Organisations (KASTO)
Chinese Taipei	National Institute of Environmental Analysis (NIEA)
Thailand	Family Health International (FHI) (Thailand Office)

1 ILAC Regional Cooperation Body Member
2 ILAC Associate Member
3 ILAC Global Arrangement Signatory (ILAC Full Member)
4 APLAC Multilateral MRA – Testing, Calibration, Inspection
5 APLAC Multilateral MRA – Testing, Calibration
6 APLAC Multilateral MRA – Testing only
7 APLAC Multilateral MRA – Inspection only
8 APLAC Multilateral MRA – Testing, Calibration, Inspection, ISO 15189
9 APLAC Multilateral MRA – Testing, Calibration, ISO 15189
10 APLAC Multilateral MRA – Testing, ISO 15189
11 APLAC Multilateral MRA – Testing, Calibration, Inspection, ISO 15189, RMP
12 APLAC Multilateral MRA – Testing, Calibration, Inspection, RMP
13 APLAC Multilateral MRA – Testing, Calibration, RMP

APLAC

Asia Pacific Laboratory Accreditation Cooperation

APLAC MUTUAL RECOGNITION ARRANGEMENT

AN ARRANGEMENT TO GRANT RECOGNITION

Having fulfilled the requirements of the APLAC Mutual Recognition Arrangement, **Laboratory Accreditation Bureau, USA** is a signatory to the Arrangement.

APLAC MRA signatories:

(i) use equivalent procedures under ISO/IEC 17011 in the accreditation of laboratories against ISO/IEC 17025, medical laboratories against ISO 15189 and inspection bodies against ISO/IEC 17020;

(ii) recognise, within the scope of recognition of this MRA, the accreditation of a laboratory or inspection body by other signatories as being equivalent to an accreditation by its own organisation;

(iii) recommend and promote the acceptance by users in their economies of endorsed test, calibration and inspection reports issued by laboratories and inspection bodies accredited by APLAC MRA signatories;

(iv) investigate complaints initiated by a signatory resulting from test reports and calibration certificates issued by their accredited testing and calibration laboratories and/or inspection reports issued by their accredited inspection bodies; and

(v) inform one another, as soon as possible, of any significant changes in the status and/or operational practices in their accreditation bodies.

Accreditation Body: Laboratory Accreditation Bureau

Economy: United States of America

Scope of Recognition: Testing/Calibration

Date of Signing APLAC MRA: 5 December 2007

Terence S S Chan
APLAC Chair

Signatories to the ILAC Mutual Recognition Arrangement

No.	Accreditation Body	Economy		Scope	Original Signing Date
1	Organismo Argentino de Acreditacion (OAA)	Argentina	1	Testing Calibration	11 Aug 2005 11 Aug 2005
2	National Association of Testing Authorities, Australia (NATA)	Australia	2	Testing Calibration	2 Nov 2000 2 Nov 2000
3	Akkreditierung Austria	Austria	3	Testing Calibration	22 Sept 2002 22 Sept 2002
4	[e] [p]Belgian Accreditation Structure (BELAC)	Belgium	4	Testing Calibration	1 Aug 2006 1 Aug 2006
5	[f]Coordenação Geral de Acreditação General Coordination for Accreditation (CGCRE)	Brazil	5	Testing Calibration	2 Nov 2000 2 Nov 2000
6	Standards Council of Canada (SCC)	Canada	6	Testing Calibration	2 Nov 2000 2 Nov 2000
7	Canadian Association for Laboratory Accreditation Inc. (CALA)[r]	Canada	6	Testing	17 Nov 2005
8	Instituto Nacional de Normalización (INN)	Chile	7	Testing Calibration	8 Oct 2010 8 Oct 2010
9	[b] [o]China National Accreditation Service for Conformity Assessment (CNAS)	People's Republic of China	8	Testing Calibration	2 Nov 2000 2 Nov 2000
10	Ente Costarricense de Acreditación (ECA)	Costa Rica	9	Testing Calibration	16 Jan 2007 22 Mar 2010
11	Croatian Accreditation Agency (HAA)	Croatia	10	Testing Calibration	29 April 2010 29 April 2010
12	National Accreditation Body of Republica de Cuba (ONARC)	Cuba	11	Testing Calibration	17 Sept 2005 17 Sept 2005
13	Cyprus Organisation for the Promotion of Quality (CYS) Cyprus Accreditation Body (CYSAB)	Cyprus	12	Testing	18 Oct 2011
14	Czech Accreditation Institute (CAI)	Czech Republic	13	Testing Calibration	2 Nov 2000 2 Nov 2000
15	Danish Accreditation (DANAK)	Denmark	14	Testing Calibration	2 Nov 2000 2 Nov 2000
16	Organismo De Acreditacion Ecuatoriano (OAE)	Ecuador	15	Testing Calibration	3 Dec 2011 3 Dec 2011
17	[x]Egyptian Accreditation Council (EGAC)	Egypt	16	Testing Calibration	10 Oct 2009 10 Oct 2009
18	[g]Finnish Accreditation Service (FINAS)	Finland	17	Testing Calibration	2 Nov 2000 2 Nov 2000
19	Comite Francais d'Accreditation (COFRAC)	France	18	Testing Calibration	2 Nov 2000 2 Nov 2000
20	[w] Deutsche Akkreditierungsstelle GmbH (DakkS)	Germany	19	Testing Calibration	2 Nov 2000 2 Nov 2000
21	[j] Hellenic Accreditation System S.A. (ESYD)	Greece	20	Testing Calibration	22 May 2004 22 May 2004
22	Oficina Guatemalteca de Acreditación (OGA)	Guatemala	21	Testing Calibration	26 June 2008 14 Mar 2012
23	Hungarian Accreditation Board (NAT)	Hungary	22	Testing Calibration	28 April 2010 28 April 2010
24	Hong Kong Accreditation Service (HKAS)	Hong Kong, China	23	Testing Calibration	2 Nov 2000 2 Nov 2000
25	National Accreditation Board for Testing and Calibration Laboratories (NABL)	India	24	Testing Calibration	2 Nov 2000 2 Nov 2000

Signatories to the ILAC Mutual Recognition Arrangement

No.	Accreditation Body	Economy		Scope	Original Signing Date
26	National Accreditation Body of Indonesia (KAN)	Indonesia	25	Testing Calibration	20 June 2001 30 Dec 2003
27	[h]Irish National Accreditation Board (INAB)	Ireland	26	Testing Calibration	2 Nov 2000 2 Nov 2000
28	Israel Laboratory Accreditation Authority (ISRAC)	Israel	27	Testing Calibration	3 Nov 2001 3 Nov 2001
29	[l] L'Ente Italiano di Accreditamento (ACCREDIA)	Italy	28	Testing Calibration	2 Nov 2000 7 Oct 2010
30	Japan Accreditation Board for Conformity Assessment (JAB)	Japan	29	Testing Calibration	2 Nov 2000 28 July 2003
31	[a]International Accreditation Japan (IAJapan)	Japan	29	Testing Calibration	2 Nov 2000 2 Nov 2000
32	Voluntary EMC Laboratory Accreditation Center INC (VLAC)	Japan	29	Testing	16 Jan 2007
33	National Centre of Accreditation (NCA)	Kazakhstan	30	Testing Calibration	27 Oct 2010 27 Oct 2010
34	Korea Laboratory Accreditation Scheme (KOLAS)	Republic of Korea	31	Testing Calibration	2 Nov 2000 20 June 2001
35	Office Luxembourgeois d'Accréditation et de Surveillance (OLAS)	Luxembourg	32	Testing Calibration	14 Apr 2011 19 Apr 2012
36	Department of Standards Malaysia (Standards Malaysia)	Malaysia	33	Testing Calibration	16 Jan 2003 19 Nov 2003
37	entidad mexicana de acreditación a.c. (ema)	Mexico	34	Testing Calibration	17 Nov 2005 17 Nov 2005
38	Dutch Accreditation Council (RvA)	The Netherlands	35	Testing Calibration	2 Nov 2000 2 Nov 2000
39	International Accreditation New Zealand (IANZ)	New Zealand	36	Testing Calibration	2 Nov 2000 2 Nov 2000
40	[k]Norsk Akkreditering (NA)	Norway	37	Testing Calibration	2 Nov 2000 2 Nov 2000
41	Pakistan National Accreditation Council (PNAC)	Pakistan	38	Testing Calibration	21 May 2009 21 May 2009
42	Papua New Guinea Laboratory Accreditation Scheme (PNGLAS)	Papua New Guinea	39	Testing	12 May 2010
43	Organismo Nacional de Acreditacion (ONA)	Paraguay	40	Testing	27 April 2012
44	[q]Philippine Accreditation Office (PAO)	Philippines	41	Testing Calibration	17 Nov 2005 17 Nov 2005
45	Polish Centre for Accreditation (PCA)	Poland	42	Testing Calibration	19 Jan 2005 19 Jan 2005
46	Instituto Portugues de Acreditacao (IPAC)	Portugal	43	Testing Calibration	10 May 2006 10 May 2006
47	Romanian Accreditation Association (RENAR)	Romania	44	Testing Calibration	22 May 2004 28 May 2009
48	Association of Analytical Centers "Analitica" (AAC "Analitica")	Russian Federation	45	Testing	21 May 2009
49	Singapore Accreditation Council (SAC)	Singapore	46	Testing Calibration	2 Nov 2000 2 Nov 2000
50	Accreditation Board of Serbia (ATS)	Serbia	47	Testing Calibration	24 May 2012 24 May 2012
51	Slovak National Accreditation Service (SNAS)	Slovakia	48	Testing Calibration	11 June 2001 11 June 2001

Signatories to the ILAC Mutual Recognition Arrangement

No.	Accreditation Body	Economy		Scope	Original Signing Date
52	Slovenian Accreditation (SA)	Slovenia	49	Testing Calibration	28 Nov 2003 28 Nov 2003
53	South African National Accreditation System (SANAS)	South Africa	50	Testing Calibration	2 Nov 2000 2 Nov 2000
54	Entidad Nacional de Acreditacion (ENAC)	Spain	51	Testing Calibration	2 Nov 2000 2 Nov 2000
55	Sri Lanka Accreditation Board for Conformity Assessment (SLAB)	Sri Lanka	52	Testing	9 Dec 2009
56	Swedish Board for Accreditation and Conformity Assessment (SWEDAC)	Sweden	53	Testing Calibration	2 Nov 2000 2 Nov 2000
57	Swiss Accreditation Services (SAS)	Switzerland	54	Testing Calibration	2 Nov 2000 2 Nov 2000
58	[d]Taiwan Accreditation Foundation (TAF)	Chinese Taipei	55	Testing Calibration	2 Nov 2000 2 Nov 2000
59	[m]The Bureau of Laboratory Quality Standards, Department of Medical Sciences, Ministry of Public Health, Thailand (BLQS-DMSc)	Thailand	56	Testing	4 April 2003
60	[f] [f] National Standardization Council of Thailand – Office of the National Accreditation Council (NSC – ONAC)	Thailand	56	Testing Calibration	3 Nov 2001 3 Nov 2001
61	Bureau of Laboratory Accreditation, Department of Science Service, Ministry of Science and Technology (BLA-DSS)	Thailand	56	Testing	23 Aug 2006
62	Tunisian Accreditation Council (TUNAC)	Tunisia	57	Testing Calibration	2 Apr 2008 2 Apr 2008
63	The Accreditation Institute of the former Yugoslav Republic of Macedonia (IARM)	The former Yugoslav Republic of Macedonia	58	Testing Calibration	19 Apr 2012 19 Apr 2012
64	Turkish Accreditation Agency (TURKAK)	Turkey	59	Testing Calibration	10 May 2006 10 May 2006
65	Dubai Municipality – Accreditation Department (DAC)	United Arab Emirates	60	Testing Calibration	18 Oct 2009 18 Oct 2009
66	United Kingdom Accreditation Service (UKAS)	United Kingdom	61	Testing Calibration	2 Nov 2000 2 Nov 2000
67	American Association for Laboratory Accreditation (A2LA)	USA	62	Testing Calibration	2 Nov 2000 2 Nov 2000
68	National Voluntary Laboratory Accreditation Program (NVLAP)	USA	62	Testing Calibration	2 Nov 2000 2 Nov 2000
69	[c]International Accreditation Service, Inc (IAS)	USA	62	Testing Calibration	2 Nov 2000 9 May 2005
70	[s]ANSI-ASQ National Accreditation Board *doing business as* ACLASS [s]ANSI-ASQ National Accreditation Board *doing business as* FQS	USA	62	Testing Calibration Testing	14 Sept 2006 14 Sept 2006 10 Dec 2010
71	Laboratory Accreditation Bureau (L-A-B)	USA	62	Testing Calibration	6 Dec 2007 6 Dec 2007
72	Perry Johnson Laboratory Accreditation, Inc. (PJLA)	USA	62	Testing Calibration	6 June 2008 21 May 2009
73	American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB)	USA	62	Testing	7 April 2009

Signatories to the ILAC Mutual Recognition Arrangement

No.	Accreditation Body	Economy		Scope	Original Signing Date
74	AIHA Laboratory Accreditation Program, LLC (AIHA-LAP, LLC)	USA	62	Testing	22 Aug 2010
75	Organismo Uruguayo De Acreditación (OUA)	Uruguay	63	Testing	22 Oct 2010
76	[n]Bureau of Accreditation (BoA)	Vietnam	64	Testing Calibration	2 Nov 2000 2 Nov 2000

Signatories to the ILAC Mutual Recognition Arrangement

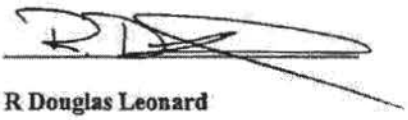
(a) IAJapan was formed from a restructure of JCSS and JNLA on 1 April 2002.
(b) CNAL was formed from a restructure of CCIBLAC and CNACL on 20 Feb 2003
(c) IAS was formed from a restructure of ICBO on 1 Dec 2002
(d) TAF was formed from a restructure of CNLA on 16 April 2005
(e) BELTEST and BKO/OBE originally signed the MRA
(f) Diretoria de Credenciamento e Qualidade/Instituto Nacional de Metrologia, Normalizacao e Qualidade Industrial (INMETRO) originally signed the MRA
(g) FINAS, Finnish Accreditation Service Centre for Metrology and Accreditation originally signed the MRA. Their name changed to Finnish Accreditation Service (FINAS)
(h) The Irish National Accreditation Board (NAB) originally signed the MRA. NAB changed their name to Irish National Accreditation Board (INAB)
(i) Thai Laboratory Accreditation Scheme (TLAS) originally signed the MRA. TLAS changed their name to TISI
(j) Hellenic Accreditation Council originally signed the MRA. Hellenic Accreditation Council changed their name to Hellenic Accreditation System S.A. (ESYD)
(k) Norwegian Accreditation originally signed the MRA. Norwegian Accreditation changed their name to Norsk Akkreditering (NA)
(l) Sistema Nazionale per l'Accreditamento originally signed the MRA. Sistema Nazionale per l'Accreditamneto changed their name to Sistema Nazionale per l'Accreditamneto di Laboratori (SINAL).
ACCREDIA was formed as a result of the incorporation of SINAL and SINCERT and was accepted as signatory to the EA MLA on 29 May 2009 for testing only.
SIT (original signing date – 9 April 2003 for calibration only) was incorporated into COPA. EA MLA signatory status was transferred to COPA on 4 November 2009. Signatory status of COPA to the ILAC MRA was withdrawn effective 21 May 2010 as a result of the termination of COPA's membership in EA as per EA Resolution 2010 (25) 3. ACCREDIA assumed the responsibilities for the accreditation of calibration laboratories in Italy from July 2010 as COPA was no longer operational. ACCREDIA was accepted as a signatory to the EA MLA for calibration on 7 October 2010.
(m) Bureau of Laboratory Quality Standards (BLQS) Department of Medical Sciences (DMSc) originally signed the MRA. Their name changed to The Bureau of Laboratory Quality Standards, Department of Medical Sciences, Ministry of Public Health, Thailand (BLQS-DMSc)
(n) Vietnam Laboratory Accreditation Scheme (VILAS/STAMEQ) originally signed the MRA. Their name changed to Bureau of Accreditation (BoA)
(o) CNAS was formed from the merger of CNAL and CNAB
(p) BELTEST and BKO/OBE ceased to exist on 1 August 2006
(q) PAO was reinstated as a signatory by the APLAC MRA Council for testing and calibration on 10 December 2008. This follows the suspension as a result of the Resolution of the APLAC MRA Council on 5 June 2008 whereby the signatory status for calibration and testing for PAO was suspended.
(r) Canadian Association for Environmental Analytical Laboratories (CAEAL) originally signed the MRA. CAEAL changed its name to Canadian Association for Laboratory Accreditation Inc. (CALA) on 23 June 2008
(s) Assured Calibration and Laboratory Accreditation Select Services was acquired by ANSI-ASQ National Accreditation Board and are now know as ANSI-ASQ National Accreditation Board *doing business as* ACLASS as of 18 September 08. As of 1 January 2012, ANSI-ASQ National Accreditation Board acquired Forensic Quality Services (FQS) a signatory to the ILAC MRA for testing since 10 December 2010 and are now known as ANSI-ASQ National Accreditation Board doing business as FQS.
(t) TLAS changed their name to National Standardization Council of Thailand – Office of the National Accreditation Council on 29 January 2009.
(w) DakkS was formed from a merger of DGA and DKD in December 2009.
DGA was formed from a merger of Deutsches Akkreditierungssytem Prufwesen (DAP), Deutsche Akkreditierungsstelle (DACH), and Deutsche Akkreditierungsstelle Technik in Trägergemeinschaft für Akkreditierung German Association for Accreditation GmbH (DATech in TGA GmbH).
(x) National Laboratories Accreditation Bureau (NLAB) merged into EGAC as of 28 December 2009.

ILAC MUTUAL RECOGNITION ARRANGEMENT

SIGNATORIES

We, the undersigned, endorse the terms of the ILAC Arrangement and undertake, to the best of our ability, fulfillment of its objectives.

Accreditation Body:	Laboratory Accreditation Bureau (L-A-B)
Economy:	USA
Scope:	Testing and Calibration
Authorised Representative:	R Douglas Leonard

Signature:  **Date:** 6 December 2007

R Douglas Leonard

Chairman, ILAC Arrangement Council:

Signature: _____ **Date:** 6 December 2007

Daniel Pierre